Claims 166-171 are presently active in this application. Claims 166 and 168-170 have been amended to better clarify the present invention without the introduction of any new matter.

The outstanding Office Action includes a rejection of Claims 166-169 under 35 U.S.C. § 103(a) as being unpatentable over JP 62-98340 (hereinafter JP '340) and a rejection of Claims 170 and 171 under 35 U.S.C. § 103(a) as being unpatentable over Onishi or Nishio (U.S. Patent No. 4,864,470) in view of JP '340.

REQUEST FOR WITHDRAWAL OF IMPROPER ACTION

At the outset, it is noted that the rejection of Claims 170 and 171 is improper because it fails to conclusively identify which of the Onishi references of record is being relied upon as being "Onishi." In this regard, the last Office Action included a rejection of Claims 170 and 171 over "Yatsuda, Onishi or Tsuji." At that time the only "Onishi" reference was Onishi et al , U.S. Patent No. 5,824,665. However, a second Onishi et al, U.S. Patent No. 5,459,368, is listed on the FORM PTO-892 attached to this Office Action. Both Onishi '665 and Onishi '368 show SAW flip-chip mounting to a circuit board via conductive bumps and that the space between the PCB and SAB board is surrounded by adhesive.

Accordingly, it is respectfully submitted that the present improper Office Action should be withdrawn because of the ambiguous reliance upon "Onishi" as evidence of obviousness used to reject Claims 170 and 171.

SUMMARY

Before turning to the outstanding prior art rejections, it is believed that a brief review of the present invention would be helpful.

In this respect, a first aspect of the present invention relates to a surface acoustic wave (SAW) device that includes a printed circuit board (PCB) that has a PCB wiring pattern a part of which is thicker in terms of having a greater thickness of conductive material than that of the other parts of the wiring pattern. In the first aspect of the present invention, the thickness of the conductive material can be added to that of the conductive connecting member to advantageously precisely control a desired volume as to the space portion effectively provided between the SAW element and the PCB.

In addition, this SAW device includes a sealing member that seals a space portion formed between a surface of the PCB and a surface of the interconnected SAW transducer element. The sealing member has a sealing portion making contact with a first board surface over a contact area on the first board surface completely outside of the space and is formed from a hot-melt material having a characteristic preventing the hot-melt material from spreading into the space. Even though a dam or a frame-shaped member is not used, this sealing member will not spread or otherwise intrude into the space portion between the SAW element and the PCB. Accordingly, a propagation path for a surface acoustic wave is ensured in a transducer portion of the SAW element and the construction of the device is simplified because no process for forming a dam or the like is required resulting in a reduction of the number of fabrication process steps and fabrication costs.

In a second aspect of the present invention, a SAW device is provided that comprises a PCB having a first region and a second region including a material that is thicker than the material in the first region, and the above-mentioned sealing member. In this second aspect of the present invention, the thickness of the second region material contributes to determining the spacing between the SAW element and the PCB and a desired volume of the space can be formed between the SAW element and PCB. The claimed sealing member is

again structured to prevent any sealing material being present in the space and provides the benefits noted above.

In a third aspect of the present invention, the appropriate volume of the space between the SAW element and the PCB is very precisely determined by a stacked arrangement of bumps being used as a conductive connecting member. Again, even though a dam or a frame-shaped member is not used, the sealing member is fabricated so that it does not spread or intrude into the space portion between the SAW element and the PCB to ensure providing a propagation path for a surface acoustic wave while providing the benefits noted above.

REJECTION TRAVERSALS

Turning to the rejection of Claims 166-169 as being unpatentable over JP '340, it is first noted that JP '340 discloses a SAW device that has a lead frame with a projection. In this SAW device, a connecting pad of the SAW element is connected to the projection of the lead frame. Page 2 of the outstanding Office Action attempts to create a teaching that the element labeled as 16 in JP '340 is intended to act with element 17 thereof as same type of "sealing member" and then to suggest that these two elements together will provide "an internal space that is defined by the volume not filled by #16, #17; thus it does not intrude into this space."

However, it is clear that element 16 of Figs. 2 and 3 of JP '340 is made of SOUND ABSORBING MATERIAL and that the attempt by the PTO to label it as having any sealing or seating function is not proper. In this regard, absent a clear teaching in JP '340 that SOUND ABSORBING MATERIAL 16 is to perform any sealing or seating function, the PTO can only be making the type of unwanted assumption based upon conjecture that the

precedent of the PTO reviewing court prohibits. See In re Piasecki, 223 USPQ 785, 788 (Fed. Cir. 1984) as follows:

> The Supreme Court in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), focused on the procedural and evidentiary processes in reaching a conclusion under section 103. As adapted to ex parte procedure, Graham is interpreted as continuing to place the "burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103". *In re Warner*, 379 F.2d 1011, 1016, 154 USPQ 173, 177 (CCPA 1967).

This Warner decision (at 154 USPQ 178) is further crystal clear that "speculation" or "unfounded assumption" are not substitutes for this required "factual basis" that must be shown.

In this regard, further note the REQUIREMENT of the PTO reviewing court that the PTO must produce concrete evidence in In re Zurko, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) quoted in the last response in part as follows:

> With respect to core factual findings and determination of patentability, however, the [PTO] cannot simply reach conclusions based on its own understanding or expertise -- or on its assessment of what would be basic knowledge or common sense. Rather, the [PTO] must point to some concrete evidence in the record in support of these findings. [Emphasis added]

Also note In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) as follows:

> The factual inquiry whether to combine references must be thorough and searching. It must be faced on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with.

Clearly, the PTO assumption that #16 and #17 can be said to meet the language of independent Claims 166 and 168 that require a "sealing member" and not a SOUND ABSORBING member adhered by an adhering layer is unreasonable. See In re Cortright 49 USPQ 2d 1464, 1467 (Fed. Cir. 1999) ("Although the PTO must give claims their broadest reasonable interpretation, this interpretation must be consistent with the one those skilled in the art would reach.").

To even more clearly highlight the unreasonableness of the PTO position, the previously-claimed nature of the sealing member as being of "hot-melt material" and in contact with the PCB surface "over a contact area on the first boards surface completely outside the space," are again added. As these added limitations clearly are not new to the prosecution, no new matter, new search, or any other new consideration is involved. Moreover, as the outstanding Office Action is clearly improper for the reasons noted above, entry of the present amendment is clearly in order.

With further regard to independent Claim 168, the SAW device of JP '340 does not include the claimed PCB having a first region and a second region of a material which is of a greater thickness in the second region than in the first region. The conductors on a printed circuit board cannot be reasonably read as part of the board itself given the understanding and usage of these terms in the art and the well established precedent that the PTO cannot completely ignore the understanding that the artisan would have of words used in the claims read in light of the specification and to ascribe a completely different meaning thereto. See again the above-noted Cortright decision.

Turning to the subject matter of dependent Claims 167 and 169, it is first noted that these claims are respectively dependent on Claims 166 and 168 and should be considered allowable for the same reasons that each of these present claims are clearly allowable. In addition, each of these dependent claims further add the feature of limiting the difference in claimed thickness that has been improperly dismissed.

In this regard, the outstanding Office Action attempts to characterize these specific limitations as somehow being "within the skill expected of the routineer" (at the bottom of page 2) and "mundane routine design considerations (at the top of page 3).

Turning to improper reliance on what has been merely alleged to be a "mundane routine design consideration," it is again noted that the case law prohibits attempts to dismiss and /or ignore claim limitations that provide advantages like the ones at issue here. See again In re Kuhle, 188 USPQ 7, 9 (CCPA 1975) and In re Chu, 36 USPQ2d 1089, 1095 (Fed. Cir. 1995) cited and discussed in detail at page 11 of the last filed response.

Furthermore, the case law clearly requires that the PTO must establish evidence of motivation to support all proposed obviousness modifications, not just those the PTO deems somehow more than "within the skill expected of the routineer." While the nature of the motivation can be different in different circumstances, the requirement for evidence cannot be avoided by simply invoking undocumented "skill expected of the routineer" as at the bottom of page 2 of the outstanding Action. In re Rouffet, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998) clearly holds that the PTO cannot simply invoke some expected level of skill as a substitute for a proper showing of actual motivation as attempted here.

The rejection of Claims 170 and 171 over "Oshimo or Nishio in view of Japan (62-98340)" can only be answered based upon Nishio because, as explained above, the rejection fails to properly identify which "Oshimo" is being relied on.

Accordingly, turning to Nishio, it is noted that while this reference discloses a mounting device for a SAW device in which its functional surface faces a base plate and a space is formed there between, Nishio neither teaches nor suggests that the conductive connecting member is made up of a plurality of bumps that are stacked together to accurately obtain a desired spacing between a PCB and a SAW element. In addition, the SAW device of Nishio does not include the sealing member as claimed and corrects for none of the above-noted deficiencies of JP '340 in this regard.

Moreover, the SAW device of JP '340 is not taught or suggested to include a conductive connecting member composed of stacked bumps. The multiple layers (a sound absorbing material #16 and an adhesive material #17) of JP '340 are clearly different from the claimed stacked bumps and are not concerned with achieving the benefits only disclosed in this application. Similarly, elements 14a, 15a, shown by JP '340 are clearly different from the claimed stacked bumps and are not concerned with achieving the benefits only disclosed in this application. Thus, JP '340 includes no teaching or suggestion as to any precise control of the thickness of multiple layers of #16 and #17 or of contacts 14a, 15a. Accordingly, an appropriate volume of the space portion of concern to Applicants cannot be secured effectively between the SAW element and the PCB of JP '340 following the teachings demonstrated to be prior art teachings.

The provision of multiple bumps in the claimed stacked arrangement is clearly disclosed as one advantageous way to provide desired spacing between the PCB and the SAW element without the need or expense of controlling the thickness of the PCB or other conductive material. See the specification at page 319, lines 20-26, for example. Once again, a "design choice" rationale cannot be used instead of showing motivation, see In re Chu, and In re Kuhle, cited above and in the last response. Similarly, the use of more precise control of spacing achieved by using stacked bumps instead of one larger bump cannot be simply dismissed as being "within the skill expected of the routineer" as explained above relative to In re Rouffet, cited above.

Furthermore, and as also noted above, layer 16 and 17 of JP '340 serve different functions from the bumps of Nishio. These layers are, thus, not analogous to a single bump, much less to stacked bumps all serving the same function. The attempt to draw a generalized teaching of providing multiple layers instead of one layer of an element from the disclosure

of two different layers (#16 and #17) performing two different functions in JP '340 is clearly mistaken. The attempt here to abstractly view layer 16 and 17 totally out of their disclosed context violates the directives of the court in In re Kotzab, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("[reference] statements cannot be viewed in the abstract. Rather, they must be considered in the context of the teaching of the entire reference.").

Finally, bottom of page 3 attempts to pass off the unsupported subjective belief that ultrasonic bonding or reflow soldering would cause the claimed stacked bumps to "lose their identity in the finished product" as if this unsupported subjective belief were a proven fact in clear violation of the recent Lee decision cited above. See Lee at 61 USPQ2d 1434 and its emphasis there that questions material to patentability cannot "be resolved on subjective belief and unknown authority." Again, the PTO must carry its burden of proof as to a factual basis set forth by In re Piasecki, supra, without substituting assumption and conjecture for demonstrations of actual facts.

As no further issues are believed to be outstanding in the present application, it is believed that the present application is in condition for formal allowance and an early and favorable action to that effect is, therefore, respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
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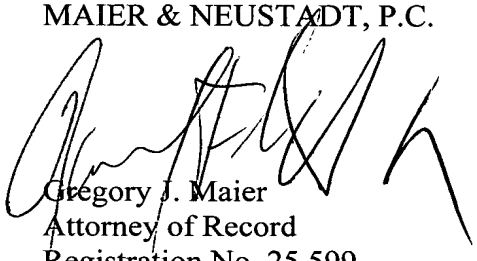

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IN THE CLAIMS

--166. (Twice Amended) A surface acoustic wave device, comprising:

a printed circuit board [processing] including a first board surface and a second board surface, the first board surface having a board wiring pattern, a part of the board wiring pattern, that is a board wiring pad, being thicker in thickness of conductive material than that of the other part;

a surface acoustic wave element possessing a first element surface and a second element surface, the first element surface including a transducer portion, a element wiring pad, and a surface acoustic wave absorbing member formed outside of the element wiring pad, and the first element surface being disposed in an opposite relation with respect to the first board surface;

a conductive connecting member disposed between the board wiring pad and the element wiring pad, and

a sealing member [configured to seal a space portion formed between the first board surface and the first element surface and to alone prevent the sealing member from spreading into the space portion] having a sealing portion making contact with the first board surface over a contact area on the first board surface completely outside of the space with the sealing

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member being formed from a hot-melt material having a characteristic preventing the hot-melt material from spreading into the space.

168. (Twice Amended) A surface acoustic wave device, comprising:

a printed circuit board of a material possessing a first region and a second region which is thicker than the first region, the second region including a board wiring pad thereon;

a surface acoustic wave element possessing a first element surface and a second element surface, the first element surface including a transducer portion, a element wiring pad and a surface acoustic wave absorbing member, and being disposed with a face-down so that the surface acoustic wave absorbing member is disposed in an opposite relation with respect to the first region of the printed circuit board;

a conductive connecting member disposed between the board wiring pad and the element wiring pad, and

a sealing member [configured to seal a space portion formed between the first board surface and the first element surface and to alone prevent the sealing member from spreading into the space portion] having a sealing portion making contact with the first board surface over a contact area on the first board surface completely outside of the space with the sealing member being formed from a hot-melt material having a characteristic preventing the hot-melt material from spreading into the space.

169. (Twice Amended) The surface acoustic wave device as set forth in claim 168,

wherein a difference between a thickness of the first region and that of the second region of the printed circuit board material is in the range of from 5 μm to 500 μm.

170. (Twice Amended) A surface acoustic wave device, comprising:

a printed circuit board including [possessing] a first board surface and a second board surface, the first board surface having a board wiring pattern;

a surface acoustic wave element possessing a first element surface and a second element surface, the first element surface including a transducer portion, a element wiring pad and a surface acoustic wave absorbing member, and the first element surface being disposed in an opposite relation with respect to the first board surface;

a conductive connecting member disposed between the board wiring pattern and the element wiring pad, the conductive connecting member being composed of a plurality of bumps stacked according to a spacing between the board wiring pattern and the element wiring pad, and

a sealing member [configured to seal a space portion formed between the first board surface and the first element surface and to alone prevent the sealing member from spreading into the space portion] having a sealing portion making contact with the first board surface over a contact area on the first board surface completely outside of the space with the sealing member being formed from a hot-melt material having a characteristic preventing the hot-melt material from spreading into the space.--